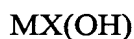


IN THE CLAIMS

Claim 1 (Currently Amended): ~~A Hydrogen-trapping~~ hydrogen-trapping compound, ~~characterized in that it comprises~~ comprising at least one mineral compound of the general formula:



~~in which~~ wherein:

- M represents a divalent transition element;
- O represents an oxygen atom;
- X represents an atom of group 16 of the Periodic Table of the Elements, excluding O; and
- H represents a hydrogen atom.

Claim 2 (Currently Amended): The compound ~~Compound according to~~ of Claim 1, ~~in which~~ wherein M is ~~chosen~~ selected from the group consisting of Cr, Mn, Fe, Co, Ni, Cu and Zn.

Claim 3 (Currently Amended): The compound ~~Compound according to~~ of Claim 1, ~~in which~~ wherein X is ~~chosen~~ selected from the group consisting of S, Se, Te and Po.

Claim 4 (Currently Amended): The compound ~~Compound according to~~ of Claim 1, ~~in which~~ wherein M is Co or Ni.

Claim 5 (Currently Amended): ~~The compound~~ Compound according to  
of Claim 1 or 4, in which wherein X is S.

Claim 6 (Currently Amended): A process ~~Process~~ for manufacturing a the  
hydrogen-trapping compound ~~according to~~ of Claim 1, the said process  
comprising:

~~the~~ mixing, in aqueous solution, ~~of~~ at least one dissolved salt of dissolved  
 $X^{2-}$  and ~~of~~ at least one dissolved metal salt of  $M[.,.]$  ; and  
~~so as to form~~ forming a precipitate of the at least one metal sulphide of the  
formula  $MX(OH)$ ; wherein the precipitate is suspended in the aqueous  
phase.

Claim 7 (Currently Amended): The process of ~~Process according to~~  
Claim 6, ~~in which~~ wherein the  $X^{2-}$  salt is ~~chosen from~~  $Na_2$ ,  $(NH_4)_2$ ,  $Li_2$ ,  $K_2$  or a  
mixture thereof.

Claim 8 (Currently Amended): The process of ~~Process according to~~  
Claim 6, ~~in which~~ wherein the metal salt of M is ~~chosen~~ selected from the group  
consisting of:  $MSO_4 \cdot xH_2O$ ;  $M(NO_3)_2$ ;  $M(ClO_4)_2 \cdot xH_2O$ ; and  $MCl_2$ ; ~~in which~~ ;  
wherein M is as defined in Claim 1 represents a divalent transition element; and  
wherein x is a number greater than or equal to zero.

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Claim 9 (Currently Amended): The process of ~~Process according to~~  
Claim 8, ~~in which~~ wherein M is Co or Ni.

Claim 10 (Currently Amended): The process of ~~Process according to~~  
Claim 8 ~~or 9, in which~~ wherein X is S.

Claim 11 (Currently Amended): The process of ~~Process according to~~  
Claim 6, ~~in which~~ wherein the mixing in aqueous solution is carried out a pH of 4  
to 12.

Claim 12 (Currently Amended): The process of ~~Process according to~~  
Claim 6, ~~in which~~ wherein the molar ratio of the concentrations  $[X^{2-}]/[M^{2+}]$  is from  
7/8 to 1.5.

Claim 13 (Currently Amended): The process of ~~Process according to~~  
Claim 6, ~~in which~~ wherein the at least one precipitated metal salt is extracted ~~from~~  
~~the preparation solution by~~ from the suspension in the aqueous phase; wherein  
extraction comprises: ~~filtration~~ filtering, washing with water, and ~~then~~ drying.

Claim 14 (Currently Amended): A method ~~Method~~ of encapsulating a solid waste, ~~the said method~~ comprising the following steps:

a) encapsulating the solid waste and the hydrogen-trapping compound of Claim 1 with an organic encapsulation material; wherein prior to encapsulation the solid waste, the hydrogen-trapping compound, and the organic encapsulation material are heated; and wherein prior to encapsulation the organic encapsulation material is liquefied; encapsulation using an organic encapsulation material, liquefied beforehand by heating the solid waste to be encapsulated, and of a hydrogen-trapping compound according to Claim 1;

b) cooling the encapsulant; and solidification of the encapsulant obtained in step a).

c) solidifying the encapsulant.

Claim 15 (Currently Amended): The method of ~~Method according to~~ Claim 14, ~~in which~~ wherein the organic encapsulation material is a bitumen.

Claim 16 (Currently Amended): The method of ~~Method according to~~ Claim 14, ~~in which~~ wherein the solid waste is ~~radioactive or~~ non-radioactive.

Claim 17 (Currently Amended): The method of ~~Method according to~~ Claim 14, ~~in which~~ wherein the solid waste is radioactive.

Claim 18 (Currently Amended): The method of ~~Method according to~~  
Claim 14 ~~or 15, in which~~ wherein the hydrogen-trapping compound is mixed with  
the bitumen in an amount of 1.5 to 82% in total, expressed as mass of trapping  
compound with respect to the mass of bitumen.

Claim 19 (Currently Amended): The method of ~~Method according to~~  
Claim 17, ~~in which~~ wherein the radioactive waste represents at least 45 wt% of the  
total mass of the solid waste encapsulated with the composite organic material  
~~after curing.~~

Claim 20 (Currently Amended): The method of ~~Method according to~~  
Claim 17, ~~which furthermore includes~~ further comprising a preliminary step of  
chemically coprecipitating the radioactive waste in solid form and ~~of synthesizing~~  
the hydrogen-trapping compound in order to obtain a solid phase ~~consisting~~  
comprising of a mixture of the radioactive solid waste and of the ~~H<sub>2</sub>~~ hydrogen-  
trapping compound prior to being encapsulated , ~~the said solid phase then being~~  
~~incorporated into the organic encapsulation material, which is preliquefied by~~  
~~heating during step a) of the process.~~

Claim 21 (Currently Amended): An organic ~~Organic~~ material for  
encapsulating radioactive waste, comprising an organic encapsulation material and  
at least one hydrogen-trapping compound ~~according to any one of~~ Claim 1  
~~Claims 1 to 5.~~

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Claim 22 (Currently Amended): ~~Organic~~ The organic material for encapsulating radioactive waste ~~according to~~ of Claim 21, ~~in which~~ wherein the organic encapsulation material is a bitumen.

Claim 23 (Currently Amended): ~~Organic~~ The organic material for encapsulating radioactive waste ~~according to Claim 21 or 22~~ of Claim 21, ~~in which~~ wherein the at least one hydrogen-trapping ~~compound(s)~~ compound represents ~~(represent)~~ in total an amount of 1.5 to 82% expressed as mass of trapping compound with respect to the mass of bitumen.

Claims 24-26 (Canceled).

Claims 27 (New): A method for trapping hydrogen comprising contacting the hydrogen with the compound of Claim 1.

Claim 28 (New): The method of Claim 27, wherein the hydrogen is produced by radiolysis of a radioactive waste and wherein the trapping is conducted within an organic material which encapsulates the both the hydrogen-trapping compound and the radioactive waste.

Claim 29 (New): The method of Claim 28, wherein the organic material is bitumen.